Appl. No.: 10/709,866
Amdt. Dated: 9/27/2007
Reply to Office action of: 03/28/2007

AMENDMENTS TO THE DRAWINGS:

There are no amendments to the drawings presented herewith.

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REMARKS/ARGUMENTS

Claims 1 – 17 remain in this application. Claims 4 – 7 and 17 have been amended using proper claim structure as well as correct minor typographical and grammatical errors.

No new matter has been introduced by these amendments to the claims.

Claims 4 – 7 and 17 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the Examiner states:

> Claims 4 – 7 and 17 recite the limitation "the base fuel". There is insufficient antecedent basis for this limitation in the claims.

Applicant respectfully traverses this rejection. By this amendment the phrase "the base fuel" has been removed. In view of these amendments to claims 4 – 7 and 17 this rejection is now moot and Applicant asks that it be removed.

Claims 1, 4 – 8, 10 – 12, 14, and 17 were rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson ('723) in view of Lyben ('304). Specifically, the Examiner states:

> Nelson discloses a motor fuel additive composition comprising (a) a fuel conditioner component and (b) a detergent component. The fuel conditioner (a) comprises (i) from 2 to 50 percent by weight of a polar oxygenated hydrocarbon compound and (ii) from about 2 to about 50 percent by weight of an oxygenated compatibilizing agent. The detergent component (b) is selected from the group consisting of (i) a reaction product of a substituted hydrocarbon (A) and an amino compound (B), and (ii) a polybutylamine or polyisobutylamine (see abstract). The polar oxygenated hydrocarbon has an average molecular weight of from about 200 to about 500, and acid number of about 25 to 175, and a saponification number of about 75 to about 200 (col. 7, lines 11 – 33). The oxygenated compatibilizing agent has a solubility parameter of from about 7.0 to about 14.0 and moderate to strong hydrogen-bonding capacity (col. 7, lines 53 – 62). The hydrocarbon compound (A) of the detergent component is a substituted hydrocarbon of the formula R_1—X wherein R_1 is a hydrocarbyl radical having a molecular weight in the range

of about 150 to 10,000 and X is selected from the group consisting of halogens, succinic anhydride and succinic dibasic acid (col. 4, lines 52 – 65). The amino compound (B) is of the formula H—(NH—(A)$_m$)$_n$—Y—R_2 wherein Y, A, m, n, and R_2 are identical to those in the instant claim 8 (col. 5, lines 1 – 21). The polybutylamine or polyisobutylamine is identical to that in instant claim 8 (col. 6, lines 30 – 46). Further, the composition includes other additives such as methyl tertiary butyl ether (MTBE) and ethyl tertiary butyl ether (ETBE), alcohols such as methanol or ethanol, and additives that are "typically employed in motor fuels" such as a common anti-knock additive, tetraethyl lead (col. 9, lines 56 – 60). Nelson also discloses examples wherein the additive composition was added to a base fuel in amounts between 40 ppm and 1000 ppm (col. 10, lines 44 – 50; col. 11, lines 14 – 20).

Nelson is silent with respect to the composition comprising a lead scavenger compound.

Lyben discloses leaded motor fuels containing anti-knock agents such as tetraethyl lead, wherein a means for removing the lead-containing products of combustion know in the art includes providing an alkyl halide lead scavenger such as ethylene dibromide and ethylene dichloride. Further, the process known as scavenging proves to be beneficial in that the lead scavengers, when co-present with the anti-knock agents reacted in a combustion chamber of an engine with the combustion products of the antiknock agents to form volatile lead halides, which in turn are efficiently removed from the combustion chamber during the exhaust cycle (col. 1, lines 20 – 40).

It would therefore have been obvious to one of ordinary skill in the art to combine the teachings of Nelson and Lyben, and include ethylene dibromide or dichloride as a lead scavenger in the additive composition of Nelson, which contains tetraethyl lead, an anti-knock agent. The scavenger would be beneficial to the composition in aiding removal of lead-containing products of combustion.

Regarding claims 6 and 7, although Nelson and Lyben do not disclose the addition of the additive composition to the base fuel simultaneously or after other additives, it is noted that "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself.

> The patentability of a product does not depend on its method of production If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process", *In re Thorpe*, 777 F.2d 695, 698 227 USPQ 964, 966 (Fed. Cir. 1985). Further, "although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product", *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). See MPEP 2113.
>
> Therefore, absent evidence of criticality regarding the presently claimed addition of the additive composition to the base fuel simultaneously or after other additives and given that Nelson and Lyben meet the requirements of the claimed composition, Nelson and Lyben clearly meet the requirements of present claims 6 and 7.

Applicant respectfully traverses these rejections. The key to Applicant's invention is providing a leaded motor fuel additive composition for bulk fuel addition. More particularly, this invention relates to a motor fuel additive composition comprising: (a) a fuel conditioner component comprising (i) a polar oxygenated hydrocarbon compound, and (ii) an oxygenated compatibilizing agent; (b) an alkyl lead compound; and (c) a lead scavenger compound for use in bulk production of motor fuels containing alkyl lead allowing lower levels of alkyl lead while improving performance and decreasing ORI.

A fair reading of the Nelson ('723) reference discloses an additive package for motor fuels having any anti-knock materials previously blended into the base motor fuel before addition of the additive package of Nelson ('723). Because of the unpredictable nature of organic compositions, adding the tetramethyl and the additive package simultaneously with, or after other additives into the fuel as opposed to adding these components to the fuel before introduction of other additive package is not obvious. This is confirmed by the fact that the amount of alkyl lead required while maintaining the desired level of anti-knock performance and ORI reduction is realized with lower amounts of alkyl lead when it is mixed into the additive package of the claimed invention as opposed to being mixed into the fuel before or after mixing in the claimed additive package.

There is nothing in the Nelson ('723) reference which discloses, teaches or suggests to one skilled in the art how to modify the reference to provide for introducing the alkyl lead and the additive package simultaneously with, or after other additives into the fuel as opposed to adding these components to the fuel before introduction of other additive packages.

A fair reading of the Lyben ('304) reference discloses the use of particular lead scavenger compounds which are taught to be more efficient than the alkyl lead compounds taught in Applicants' claimed invention (Col. 2, line 46 – Col. 3, line 7). The Lyben ('304) reference also teaches that while bromine or chloride atoms may be attached to some of the carbon atoms in these claimed compounds they may not be attached to carbon atoms containing the active portions of the molecule (Col. 3, lines 8 – 24). Thus, this reference clearly teaches away from the use of the very lead compounds claimed in Applicants' invention.

There is nothing in the Lyben ('304) reference which discloses, teaches or suggests to one skilled in the art how to modify the reference to provide for the use of the additive composition of Nelson ('723), nor the unexpected ability to reduce the amount of alkyl lead compound required while retaining desired levels of ORI reduction and anti-knock.

Clearly, when viewed in this light the Nelson ('723) reference nor the Lyben ('304) reference disclose, teach, or suggest the use of an additive composition allowing the use of lower than expected levels of alkyl lead compounds claimed in Applicants' invention while retaining engine performance as claimed in Applicants' present invention.

Claims 2 – 3, 9, 13, and 15 – 16 were rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson in view of Lyben, and further in view of Carlson ('088). Specifically, the Examiner states:

> The disclosure of Nelson and Lyben in paragraph 5 above is herein incorporated by reference.
>
> Both Nelson and Lyben are silent with respect to the amount of alkyl lead compound included in the composition.
>
> Carlson discloses a motor fuel composition including alkyl lead anti-knock agents such as tetraethyl lead, included in low amounts within the range of about 0.5

> to about 3.0 grams per gallon. The effectiveness of tetraethyl lead to rise the octane number and suppress knocking decreases with increasing quantities. Therefore, a small amount in the range disclosed proves to be beneficial to the composition (col. 1, lines 10 – 35).
>
> It would have been obvious to one of ordinary skill in the art at the time of the invention by applicant to combine the teachings of Nelson, Lyben, and Carlson in order to utilize the benefits of tetraethyl lead at low amounts.

Applicant respectfully traverses these rejections. The key to Applicant's invention, as mentioned above, is providing a leaded motor fuel additive composition for bulk fuel addition. More particularly, this invention relates to a motor fuel additive composition comprising: (a) a fuel conditioner component comprising (i) a polar oxygenated hydrocarbon compound, and (ii) an oxygenated compatibilizing agent; (b) an alkyl lead compound; and (c) a lead scavenger compound for use in bulk production of motor fuels containing alkyl lead allowing lower levels of alkyl lead while improving performance and decreasing ORI.

A fair reading of the Nelson ('723) reference, as mentioned above, discloses an additive package for motor fuels having any anti-knock materials previously blended into the base motor fuel before addition of the additive package of Nelson ('723). Because of the unpredictable nature of organic compositions, adding the tetramethyl and the additive package simultaneously with, or after other additives into the fuel as opposed to adding these components to the fuel before introduction of other additive package is not obvious. This is confirmed by the fact that the amount of alkyl lead required while maintaining the desired level of anti-knock performance and ORI reduction is realized with lower amounts of alkyl lead when it is mixed into the additive package of the claimed invention as opposed to being mixed into the fuel before or after mixing in the claimed additive package.

There is nothing in the Nelson ('723) reference which discloses, teaches or suggests to one skilled in the art how to modify the reference to provide for introducing the alkyl lead and the additive package simultaneously with, or after other additives into the fuel as opposed to adding these components to the fuel before introduction of other additive packages.

A fair reading of the Lyben ('304) reference, as mentioned above, discloses the use of particular lead scavenger compounds which are taught to be more efficient than the alkyl lead compounds taught in Applicants' claimed invention (Col. 2, line 46 – Col. 3, line 7). The Lyben ('304) reference also teaches that while bromine or chloride atoms may be attached to some of the carbon atoms in these claimed compounds they may not be attached to carbon atoms containing the active portions of the molecule (Col. 3, lines 8 – 24). Thus, this reference clearly teaches away from the use of the very lead compounds claimed in Applicants' invention.

There is nothing in the Lyben ('304) reference which discloses, teaches or suggests to one skilled in the art how to modify the reference to provide for the use of the additive composition of Nelson ('723), nor the unexpected ability to reduce the amount of alkyl lead compound required while retaining desired levels of ORI reduction and anti-knock.

A fair reading of the Carlson ('088) reference discloses the use of aromatic substituted esters as an additional compound to raise the octane number, and help suppress knocking in leaded gasoline fuels (Col. 1, lines 51 – 60). This reference realizes that alkyl lead compounds have a limit to effectiveness that decreases with increased amounts of these alkyl lead compounds in gasoline and the fact that they create deposits in the combustion chambers. Instead of scavenging these deposits this reference teaches to add a substitute octane enhancer in addition to the use of alkyl lead compounds. Thus, this reference clearly teaches away from the sole use of the very lead compounds claimed by Applicant's invention and how to reduce the amount of these alkyl lead compounds without the addition of other anti-knock compounds.

There is nothing in the Carlson ('088) reference which discloses, teaches or suggests to one skilled in the art how to modify the reference to provide for the use of the additive composition of Nelson ('723) and the novel organo lead compounds of Lyben ('304), or the unexpected ability to reduce the amount of alkyl lead compound required while retaining desired levels of ORI reduction and anti-knock, in combination with a second class of octane enhancer/anti-knock compounds.

Claims 1 – 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson in view of Carlson ('088). Specifically, the Examiner states:

> The disclosure of Nelson in paragraph 5 above is herein incorporated by reference.

Nelson is silent with respect to the composition comprising a lead scavenger compound, and the amount of anti-knock additive, tetraethyl lead, included in the composition.

Carlson discloses a motor fuel composition including alkyl lead anti-knock agents such as tetraethyl lead, and alkyl halide lead scavengers such as ethylene dibromide and dichloride. Tetraethyl lead is included in low amounts within the range of about 0.5 to 3.0 grams per gallon. The effectiveness of tetraethyl lead to rase the octane number and suppress knocking decreases with increasing quantities. Therefore, a small amount in the range disclosed proves to be beneficial (col. 1, lines 10 – 35). The lead scavengers, such as ethylene dibromide and ethylene dichloride, impart useful properties to the fuel in its use in internal combustion engines (col. 3, lines 56 – 71).

It would have been obvious to one of ordinary skill in the art at the time of the invention by applicant to combine the teachings of Nelson and Carlson in order to utilize the benefits of alkyl lead anti-knock agents and alkyl halide lead scavengers as disclosed in Carlson.

Regarding claims 6 and 7, although Nelson and Carlson do not disclose the addition of the additive composition to the base fuel simultaneously or after other additives, it is noted that "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process", *In re Thorpe*, 777 F.2d 695, 698 227 USPQ 964, 966 (Fed. Cir. 1985). Further, "although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product", *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). See MPEP 2113.

Therefore, absent evidence of criticality regarding the presently claimed addition of the additive composition to the base fuel simultaneously or after other additives and

given that Nelson and Carlson meet the requirements of the claimed composition, Nelson and Carlson clearly meet the requirements of present claims 6 and 7.

Applicant respectfully traverses these rejections. The key to Applicant's invention, as mentioned above, is providing a leaded motor fuel additive composition for bulk fuel addition. More particularly, this invention relates to a motor fuel additive composition comprising: (a) a fuel conditioner component comprising (i) a polar oxygenated hydrocarbon compound, and (ii) an oxygenated compatibilizing agent; (b) an alkyl lead compound; and (c) a lead scavenger compound for use in bulk production of motor fuels containing alkyl lead allowing lower levels of alkyl lead while improving performance and decreasing ORI.

A fair reading of the Nelson ('723) reference, as mentioned above, discloses an additive package for motor fuels having any anti-knock materials previously blended into the base motor fuel before addition of the additive package of Nelson ('723). Because of the unpredictable nature of organic compositions, adding the tetramethyl and the additive package simultaneously with, or after other additives into the fuel as opposed to adding these components to the fuel before introduction of other additive package is not obvious. This is confirmed by the fact that the amount of alkyl lead required while maintaining the desired level of anti-knock performance and ORI reduction is realized with lower amounts of alkyl lead when it is mixed into the additive package of the claimed invention as opposed to being mixed into the fuel before or after mixing in the claimed additive package.

There is nothing in the Nelson ('723) reference which discloses, teaches or suggests to one skilled in the art how to modify the reference to provide for introducing the alkyl lead and the additive package simultaneously with, or after other additives into the fuel as opposed to adding these components to the fuel before introduction of other additive packages.

A fair reading of the Carlson ('088) reference, as mentioned above, discloses the use of aromatic substituted esters as an additional compound to raise the octane number, and help suppress knocking in leaded gasoline fuels (Col. 1, lines 51 – 60). This reference realizes that alkyl lead compounds have a limit to effectiveness that decreases with increased amounts of these alkyl lead compounds in gasoline and the fact that they create deposits in the combustion chambers. Instead of scavenging these deposits this reference

teaches to add a substitute octane enhancer in addition to the use of alkyl lead compounds. Thus, this reference clearly teaches away from the sole use of the very lead compounds claimed by Applicant's invention and how to reduce the amount of these alkyl lead compounds without the addition of other anti-knock compounds.

There is nothing in the Carlson ('088) reference which discloses, teaches or suggests to one skilled in the art how to modify the reference to provide for the use of the additive composition of Nelson ('723) or the unexpected ability to reduce the amount of alkyl lead compound required while retaining desired levels of ORI reduction and anti-knock, in combination with a second class of octane enhancer/anti-knock compounds.

Applicant notes the references cited by the Examiner but not used as a basis of rejection. In view of these references not being a basis of rejection, Applicant makes no further comment about them.

In view of the remarks herein, and the amendments hereto, it is submitted that this application is in condition for allowance, and such action and issuance of a timely Notice of Allowance is respectfully solicited.

Respectfully submitted,

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